

**INNOVATIVE APPROACHES TO COMPLETING INDEPENDENT GRAPHIC TASKS  
IN THE COURSE OF ENGINEERING AND COMPUTER GRAPHICS**

**Vardiyashvili Afdandil Askarovich,**

Professor, Karshi State University,

**Boymuratov Farrukh Khamzayevich**

Senior lecturer at Karshi State Technical University

**Abstract:** The article highlights the significance of teacher preparation, innovative pedagogical approaches, and the role of independent graphic tasks in teaching engineering and computer graphics. Methods for developing students' graphic literacy, stages of evaluating independent work, and methodological strategies in the educational process are examined. In particular, the organization and assessment of students' independent graphic assignments are scientifically justified.

**Keywords:** engineering graphics, teacher preparation, independent graphic tasks, lesson plan, academic calendar, graphic literacy, checking graphic works, assessment, methodology.

**Introduction.** In today's technical education system, the importance of the Engineering and Computer Graphics course is increasing. This discipline develops competencies in design, drafting, and graphical data analysis among future specialists. Enhancing students' spatial imagination, analytical thinking, and graphical communication skills depends largely on the teacher's methodological approach.

**Main Part.** Independent graphic tasks serve to apply theoretical knowledge in practice, develop creative thinking, and improve graphic literacy. These tasks are completed according to standards and assessed step-by-step. The teacher's approach to correcting students' errors directly affects their learning motivation.

Various lesson formats are applied depending on didactic goals such as acquiring new knowledge, developing graphic skills, and mastering reading and creating technical drawings. To help students gain theoretical and practical skills, specific didactic problems are used, especially in developing projection skills and graphical interpretation.

Engineering and computer graphics lessons should develop the following abilities:

- a) Enriching imagination and cognitive processes in learning (attention, memory, goal-directed thinking)
- b) Understanding and using symbolic, graphic, and visual systems

Any type of activity, including the teacher's conduct of classes, requires advance preparation and planning. The curriculum is not limited only to the knowledge and skills that students need to acquire, but also determines the number of study hours recommended for studying each topic. This stage of preparation is the direct duty of the teacher, and the teacher prepares for it based on the curriculum. Taking into account local conditions, the level of preparation of students, and relying on his pedagogical experience, the teacher can slightly change the number of hours allocated for studying a particular topic, as well as independently distribute the educational material for each hour. This work is carried out before the academic year, during the period when the calendar-plan is drawn up based on the lesson plan. A lesson plan is drawn up for each lesson.

Despite the fact that as a result of a number of objective and subjective influences, the teacher is sometimes forced to make changes to the previously drawn up calendar-plan, he should consider the careful development of the plan in advance as a necessary and responsible stage of his professional activity. The quality of the plan is determined by the teacher's clear and complete idea of the information, practical skills and qualifications that he wants to teach students,

the nature of the difficulties associated with studying each section of the program, and the level of preparation of students. The teacher draws up lesson plans based on the calendar-plan throughout the year and accurately determines the information necessary for drawing up a plan for the next year.

Before creating a calendar - plan, it is recommended that teachers (especially young teachers) familiarize themselves with the plans drawn up for other subjects at school (mathematics, physics, theoretical and applied mechanics) and study the changes made to them in recent years. They will also be greatly helped by studying methodological articles on engineering and computer graphics, articles in methodological journals such as "Public Education", "Problems of Education", "Continuous Education".

Students' knowledge of engineering and computer graphics, and their interest in graphic literacy, depends on a number of influences.

The study of engineering and computer graphics, like other subjects, should be educational in nature and conducted on a highly scientific basis. The teacher should always explain the relationship between theory and practice. In the initial lessons, students should be explained the importance of engineering and computer graphics in the national economy and technical progress. Students should acquire knowledge and skills in engineering and computer graphics that are necessary for modern production and further education. In the process of preparing for the lesson, the teacher should clearly imagine the structure, volume and content of the educational material. It is necessary to determine the goals and objectives of the lesson in advance. When preparing for and passing the lesson, one should not work according to the same scheme and template that has been learned every time.

The teacher must remember that unforeseen situations may arise in the lesson. Therefore, he must always be able to convey the learning material to the students, without deviating from the main goal, and when necessary, to master the lesson. The content of the lesson and the methodology for its delivery must be very clearly planned.

In order for students to gain a solid understanding of the basics of graphic literacy, the teacher must have a deep knowledge of the theoretical and practical foundations of engineering and computer graphics. He must also have high methodological skills in teaching the subject, and the ability to interest students in the subject.

The teacher must always remember that the outcome and result of the lesson are directly related to the attitude and interest of students to the subject, their preparation, knowledge and skills. Negligence, irresponsibility and other shortcomings always have a negative impact on the results of working with students. The following words of A.S. Makarenko are very relevant in this regard: "If your work is always accompanied by failures and shortcomings, if at every step it is obvious that you do not know your job, you will not achieve anything more than humiliation and various ironies". The teacher must constantly work on improving his spiritual, political and educational level. He must be well aware of our national values, the rich cultural heritage and past of the Uzbek people, and explain these to students in their place during the lesson and instill them in their minds.

Students of technical, pedagogical universities (institutes, technical schools) must complete mandatory individual graphic tasks specified in the program of engineering and computer graphics and work assigned to test their theoretical knowledge. A graphic task, that is, an individual work, is understood as a drawing that is performed independently at home (outside of class) on the basis of the topic studied. Graphic work is performed in a certain format (format) and in accordance with standard rules.

The formation of graphic knowledge in students is a complex process and is closely related to the educational process. The ability to take into account the specific characteristics of all students

in the educational process and pass the lesson will not be as high as with an individual approach to performing educational and graphic work. Therefore, the teacher can realize the opportunities that he could not use during the lesson with students by performing independent and graphic work. Many years of observations show that students mainly acquire knowledge and skills through individual educational and graphic work. Because the theoretical knowledge given in the lesson is mainly reinforced in practice through graphic work.

The best results come from checking graphic works in stages. The first check can be carried out after students have drawn graphic works in thin lines. In this case, the student checks how the drawing is placed on the paper, the border (frame), and the errors in the main inscription in the lower right corner of the drawing. The scale of the drawing, dimensions, and geometric constructions are carefully observed. If the requirements of the standard are met correctly, the word "Permission to draw" is written in pencil and the date of the check is indicated.

If the requirements of the standard are violated, there are errors in the drawing, it is better to explain the topic to the student again in full. Such a drawing is marked with the word "To be corrected" and the date of the check is indicated. In this manner, the drawing is checked repeatedly until it is free of errors, and the ways to correct the errors made must be explained without delay. Through subsequent checks, when working with students individually, the teacher will learn which student to recommend a graphic work option of what complexity, and to which to explain the topic in a generalized or detailed manner.

After the drawings are completed, a second check can be carried out. It is important that the thickness of the lines is the same throughout the drawing. Often, students do not draw dimension and center lines according to the standard requirements, but draw them from the detail contour, and the extension line is drawn beyond the dimension line, that is, they do not erase more than 3-5 mm. In this case, the main goal is to ensure that the requirements of the standard are fully met. In the final check, the correctness of the main inscription is checked and evaluated. Some students make mistakes even at the final stage of drawing the drawing. In such a situation, it is necessary to allow, if possible, to correct the error in the drawing without redrawing the drawing. A pencil should be used to check and correct errors in the drawings. Because students, seeing an ink pen in the hands of some teachers, become worried, thinking, "Now they will color my drawing in ink." When assessing graphic work, the quality and timeliness of the drawing are taken into account.

**Conclusion.** Innovative pedagogical approaches and individualized instruction in teaching Engineering and Computer Graphics foster students' independent work skills, enhance graphic literacy, and strengthen professional readiness. Gradual increase in the complexity of graphic tasks boosts interest in the discipline, ensures deep knowledge acquisition, and develops creative and technical thinking. As a result, students' engineering competencies and readiness for professional activity significantly improve.

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